REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed

August 12, 2004 (Paper No. 4). Upon entry of this response, claims 1-31 and 34-51 are pending

in the application. In this response, claims 1, 2, 7, 9-10, 12, 14, 23-25, 27, 34-35, 37, 40, and 43

have been amended, claims 49-51 have been added and claims 32-33 have been cancelled.

Applicant respectfully requests that the amendments being filed herewith be entered and request

that there be reconsideration of all pending claims.

1.   Allowable Subject Matter

Applicant also acknowledge the Examiner's indication in the Office Action that claim 34

would be allowable if rewritten to include all of the limitations of the base claim and any

intervening claims. Accordingly, Applicant has amended claim 34 to include the limitations of

its base claim, so that claim 34 is now an independent claim. Accordingly, the Examiner is

respectfully requested to place claim 34 in condition for allowance.

Applicant wishes to clarify that the amendment to claim 34 is made for purposes of

presenting the claim in an independent claim format as requested by the Examiner, and not in

response to any rejections made based on cited references. Because a dependent claim as a

matter of law inherently contains all of the limitations of its respective parent independent claim,

and any intervening claims, the amendments to claim 34 do not narrow the scope of claim 34 as

originally filed.

2.   Rejection of Claims 1-8, 28, 35-39, 47, and 48 under 35 U.S.C. §103

Claims 1-8, 28, 35-39, 47, and 48 have been rejected under §103(a) as allegedly obvious

over *Betts et al.* (U.S. 4,677,625) in view of *Laroia et al.* (U.S. 6,473,418) in further view of the

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Alcatel ITU Contribution "G.gen-bis: Robuster Tone Ordering and Flexible Pilot Allocation"

and ITU G.992.1. Applicant respectfully traverses this rejection. It is well established at law that,

for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a

combination of references, the cited combination of references must disclose, teach, or suggest,

either implicitly, all elements/features/steps of the claim at issue. *See, e.g., In re Dow Chemical,*

5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller,* 208 U.S.P.Q.2d 871, 881 (C.C.P.A.

1981).

a. Claims 1 and 35

1) The proposed combination does not disclose, teach, or suggest the feature of "a synchronized dual skipping switch"

The Office Action alleges that elements 16 and 42 of *Betts et al.* FIG. 1 disclose a

synchronized dual skipping switch. (Office Action, p. 3, paragraph 2). Applicant respectfully

disagrees, and asserts that switch elements 16 and 42 in *Betts et al.* are *sequential* commutators

or multiplexers (see Col. 3, lines 13-16 and lines 59-61), rather than *skipping* switches. As

explained in the Specification of the present application, "Those skilled in the art are familiar

with the operation of synchronized dual skipping switches and related skipping commutators.

The synchronized dual skipping switch 808 is skipping over consecutive binary words u

according to the depth of the interleaving desired." (Application, p. 19, lines 10-15). In contrast,

Betts et al. processes words in order and does not skip over them.

Applicant can find no switch of any kind in *Laroia et al.,* Alcatel, or ITU G992.1.

Accordingly, the proposed combination of *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 does not teach the above-described features recited in claims 1 and 35.

Since the proposed combination does not teach at least these features, a *prima facie* case

establishing an obviousness rejection by *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 has not been made. Thus, claims 1 and 35 are not obvious under the proposed combination, and the rejection should be withdrawn.

> 2) The proposed combination does not disclose, teach, or suggest the feature of a "switch...capable of communicating the plurality of bits to the conventional encoder in a non-sequential order"

The Office Action alleges that the above-described feature is suggested by the combination of *Laroia et al.* and Alcatel. (Office Action, p. 3, paragraph 3). While Applicant agrees with some of the premises used in the Office Action argument, Applicant respectfully disagrees with the conclusion.

Applicant does agree with the statements in the Office Action that *Laroia et al.* teaches an OFDM spread spectrum system with an optional convolutional encoder, and that a plurality of bits on tones is an inherent characteristic of OFDM systems. (Office Action, p. 3, paragraph 3). Applicant further agrees that *Laroia et al.* also teaches "using slow hopping in the uplink channel to optimize spectral efficiency" and that *Laroia et al.* suggests "optimizing the hopping pattern and tone assignment." (Office Action, p. 3, paragraph 3.) Applicant will further assume, *arguendo*, that Alcatel teaches the use of non-sequential frequency ordering of DMT carriers for reducing RFI.

From these premises, the Office Action reaches the conclusion that it would be obvious to one skilled in the art to "optimize *Laroia et al.*'s hopping pattern with Alcatel teaching of using non-sequential carriers, since Alcatel suggest in the abstract that the optimizing of the hopping patterns enhance DMT modulation." (Office Action, p. 4, paragraph 1). Applicant respectfully disagrees. Although some DMT tones may have zero amplitude or carry zero bit loading, DMT does not use frequency hopping. Also, *Laroia et al.* uses an interleaver to spread symbols in the time domain, using a single tone, and does not spread symbols across tones. For at least these reasons, one of ordinary skill in the art would not be motivated to "optimize *Laroia*

et al.'s hopping pattern" by combining it with Alcatel's frequency interleaving, and the rejection

of claims 28 and 47 should be withdrawn.

Furthermore, *Laroia et al.* introduces a ***conventional time domain interleaver*** "to

compensate for the reduction in the intercell interference averaging" that occurs when the same

tone is used for several symbols. (Col. 7, lines 50-60). *Laroia et al.*'s hopping pattern and tone

assignment are optimized to reduce mutual interference (Col. 1, lines 25-30; Col. 2, lines 25-35),

and are not selected to affect the sequence passed to the convolutional encoder.

b. Claims 28 and 47

1) The proposed combination does not disclose, teach, or suggest the feature of "a synchronized dual skipping switch"

The Office Action alleges that elements 16 and 42 of *Betts et al.* FIG. 1 disclose a

synchronized dual skipping switch. (Office Action, p. 3, paragraph 2). Applicant respectfully

disagrees, and asserts that switch elements 16 and 42 in *Betts et al.* are ***sequential*** commutators

or multiplexers (see Col. 3, lines 13-16 and lines 59-61), rather than ***skipping*** switches. As

explained in the Specification of the present application, "Those skilled in the art are familiar

with the operation of synchronized dual skipping switches and related skipping commutators.

The synchronized dual skipping switch 808 is skipping over consecutive binary words *u*

according to the depth of the interleaving desired." (Application, p. 19, lines 10-15). In contrast,

Betts et al. processes words in order and does not skip over them.

Applicant can find no switch of any kind in *Laroia et al.*, Alcatel, or ITU G992.1.

Accordingly, the proposed combination of *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 does not teach the above-described features recited in claims 28 and 47.

Since the proposed combination does not teach at least these features, a *prima facie* case

establishing an obviousness rejection by *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 has not been made. Thus, claims 28 and 47 are not obvious under the proposed combination, and the rejection should be withdrawn.

> 2) The proposed combination does not disclose, teach, or suggest the feature of "connect the output from the connected convolutional to a coset mapper"

The Office Action alleges that "it would have been obvious to apply the output of *Betts et al.* convolutional encoders to the coset mapper in synchronization with the order in which they are applied to the convolutional encoder." (Office Action, p. 5, paragraph 1). The Office Action does not allege which of the cited references discloses the claimed "coset mapper." Applicant will assume, *arguendo*, that ITU G.992.1 discloses a coset mapper. However, the Office Action provides no reasoning at all for the conclusion of obviousness. Therefore, a *prima facie* case establishing an obviousness rejection by *Betts et al.* in view of *Laroia et al.* in further view of Alcatel and ITU G.992.1 has not been made. Thus, claims 28 and 47 are not obvious under the proposed combination, and the rejection should be withdrawn.

c. Claims 2-8, 36-39, and 48

Since claims 1, 35, and 47 are allowable, Applicant respectfully submits that claims 2-8, 36-39, and 48 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). Therefore, Applicant respectfully requests that the rejection of claims 2-8, 36-39, and 48 be withdrawn.

3.   Rejection of Claims 9, 10, 12-27, and 40-46 under 35 U.S.C. §103

Claims 9, 10, 12-27, and 40-46 have been rejected under §103(a) as allegedly obvious over *Betts et al.* (U.S. 4,677,625) in view of *Laroia et al.* (U.S. 6,473,418) in further view of the Alcatel ITU Contribution "G.gen-bis: Robuster Tone Ordering and Flexible Pilot Allocation" and *Voith et al.* (U.S. 5,751,741).

a. <u>Claims 12 and 23</u>

Applicant respectfully submits that claims 12 and 23 are allowable for at least the reason

that the proposed combination does not disclose, teach, or suggest the feature of "means for non-

sequentially switching the plurality of bits to the means for convolutionally encoding" or "logic

for non-sequentially switching the plurality of bits to the means for convolutionally encoding."

Betts et al. discloses **sequential** commutators or multiplexers (FIG. 3; Col. 3, lines 13-16

and lines 59-61), so that *Betts et al.* processes words in order and does not skip over them. In

contrast, as explained in the Specification of the present application, "[t]hose skilled in the art are

familiar with the operation of synchronized dual skipping switches and related skipping

commutators. The synchronized dual skipping switch 808 is skipping over consecutive binary

words u according to the depth of the interleaving desired." (Application, p. 19, lines 10-15).

Applicant can find no switch of any kind in *Laroia et al.*, Alcatel, or ITU G992.1.

Accordingly, the proposed combination of *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 does not teach the above-described features recited in claims 1 and 35.

Since the proposed combination does not teach at least these features, a *prima facie* case

establishing an obviousness rejection by *Betts et al.* in view of *Laroia et al.* in further view of

Alcatel and ITU G.992.1 has not been made. m Thus, claims 1 and 35 are not obvious under the

proposed combination, and the rejection should be withdrawn.

b. <u>Claims 17 and 42</u>

Applicant respectfully submits that claims 12 and 23 are allowable for at least the reason

that the proposed combination does not disclose, teach, or suggest the feature of "receiving a first

plurality of bits on a first tone from a bit extractor buffer through a synchronized dual skipping

switch." The Office Action alleges that elements 16 and 42 of *Betts et al.* FIG. 1 disclose a

synchronized dual skipping switch. (Office Action, p. 3, paragraph 2). Applicant respectfully disagrees.

Applicant respectfully asserts that switch elements 16 and 42 in *Betts et al.* are **sequential** commutators or multiplexers (see Col. 3, lines 13-16 and lines 59-61), rather than **skipping** switches. As explained in the Specification of the present application, "Those skilled in the art are familiar with the operation of synchronized dual skipping switches and related skipping commutators. The synchronized dual skipping switch 808 is skipping over consecutive binary words *u* according to the depth of the interleaving desired." (Application, p. 19, lines 10-15). In contrast, *Betts et al.* processes words in order and does not skip over them.

Applicant can find no switch of any kind in *Laroia et al.*, Alcatel, or ITU G992.1. Accordingly, the proposed combination of *Betts et al.* in view of *Laroia et al.* in further view of Alcatel and ITU G.992.1 does not teach the above-described features recited in claims 28 and 47. Since the proposed combination does not teach at least these features, a *prima facie* case establishing an obviousness rejection by *Betts et al.* in view of *Laroia et al.* in further view of Alcatel and ITU G.992.1 has not been made. Thus, claims 28 and 47 are not obvious under the proposed combination, and the rejection should be withdrawn.

c. Claims 9, 10, 13-16, 18-22, 24-27, 40-41, and 43-46

Since claims 12, 17, 23, 35, and 42 are allowable for at least the reasons discussed above, Applicant respectfully submits that claims 9, 10, 13-16, 18-22, 24-27, 40-41, and 43-46 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). Therefore, Applicant respectfully requests that the rejection of claims 9, 10, 13-16, 18-22, 24-27, 40-41, and 43-46 be withdrawn.

4. Rejection of Claims 11 and 29-31 under 35 U.S.C. §103

Claims 11 and 29-31 have been rejected under §103(a) as allegedly obvious over *Betts et al.* (U.S. 4,677,625) in view of *Laroia et al.* (U.S. 6,473,418) and further in view of the Alcatel ITU Contribution "G.gen-bis: Robuster Tone Ordering and Flexible Pilot Allocation" and Applicant Admitted Prior Art. Applicant respectfully traverses this rejection. Since claims 1 and 28 are allowable for at least the reasons discussed above, Applicant respectfully submits that claims 11 and 29-31 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). Therefore, Applicant respectfully requests that the rejection of claims 11 and 29-31 be withdrawn.

5. Rejection of Claims 32 and 33 under 35 U.S.C. §103

Claims 32 and 33 have been rejected under §103(a) as allegedly obvious over Applicant Admitted Prior Art in view of the Alcatel ITU Contribution "G.gen-bis: Robuster Tone Ordering and Flexible Pilot Allocation." Claims 32 and 33 are cancelled without prejudice, waiver, or disclaimer, and the rejection of these claims is therefore rendered moot. Applicant takes this action merely to reduce the number of disputed issues and to facilitate early allowance and issuance of other claims in the present application. Applicant reserves the right to pursue the subject matter of these cancelled claims in a continuing application, if Applicant so chooses, and does not intend to dedicate any of the cancelled subject matter to the public.

6. Newly Added Claims

Applicant submits that no new matter has been added in the new claims 49-51 and that new claims 49-51 are allowable over the cited references. Therefore, Applicant requests that the Examiner enter and allow the above new claims.
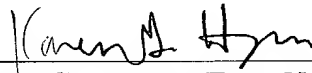
CONCLUSION

Applicant respectfully requests that all outstanding objections and rejections be

withdrawn and that this application and presently pending claims 1-31 and 34-51 be allowed to

issue. Although some dependent claim rejections and some obviousness rejections are explicitly

addressed above, the omission of arguments for other claims is not intended to be construed as

an implied admission that the Applicant agrees with the rejection or finding of obviousness for

the respective claim or claims. If the Examiner has any questions or comments regarding

Applicant's response, the Examiner is encouraged to telephone Applicant's undersigned counsel.

Respectfully submitted,

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